



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Western Pacific Region

March 20, 2019

LEFT ELECTRIC FUEL PUMP EXAMINATION

WPR19FA093

This document contains 6 embedded photos.

A. ACCIDENT

Location: Pahokee, Florida
Date: March 8, 2019
Aircraft: Piper PA 23-250, Registration N5894Y, Serial #27-3048
NTSB IIC: Samantha Link

B. EXAMINATION PARTICIPANTS:

Samantha Link
Aviation Accident Investigator
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C. SUMMARY

Examination of the left electric fuel pump was conducted on March 20, 2019 at the facilities of Weldon Pump, Cleveland, Ohio. It was noted that the shaft seal leaked, which caused fuel to be observed flowing from the overboard drain.

D. DETAILS OF THE INVESTIGATION

1.0 Left Electric Fuel Pump Examination

- The pump components were made by Weldon Pump LLC. However, the pump was not assembled or overhauled by them. They were unable to determine who assembled or overhauled this pump because the data tag did not state an overhaul facility. The tag stated that the "OV DATE" was "06/05"
- Electricity was applied to the motor and it operated.
 - Oil was added to the inlet for lubrication, which is standard on all pumps to ensure they do not operate while dry.
- The pump was pressure tested at 5 PSI and no anomalies were noted.

- When the pressure was increased to 14 PSI, fuel was observed exiting the overboard drain.
- The electric fuel pump was installed onto a test bench and operationally tested in comparison to ATP Standards.
 - The electric pump was in the vicinity of the appropriate ATP standards.
 - When 5 PSI inlet pressure was added, fuel exited the overboard drain at about 25 mL per minute.
- A vacuum pump was added to the outlet to simulate an engine driven fuel pump pulling fuel through the electric pump while the pump was in the off position.
 - The entire assembly was placed in a bag full of air in attempt to determine if a significant amount of air was being pulled in through the pump.
 - The bag did not appear to lose air.
 - The pump was turned on and the bag never deflated.
 - As an experiment, the O-ring on the vacuum gauge was removed and the bag was reinstalled over the unit. The bag lost significant air in about 2 minutes.
- The pump was disassembled
 - The inlet fuel line was removed by hand with little difficulty (it was not particularly tight)
 - The O-ring was completely flat (black in color); however, the fitting was otherwise unremarkable.
 - The outlet fuel line was removed
 - The O-ring was relatively pliable and was blue in color.
 - The fitting was unremarkable.
 - The overboard drain fitting was removed and the sealing nut was intact.
 - The fitting was unremarkable.
- The pump motor was removed from the pump
 - Fuel was noted in the drive cavity between the pump and motor.
 - Some rust was noted on the drive
 - The pump cavity was wet with fuel and some unknown debris was noted
- The pump itself was installed onto a test bench and was pressure tested.
 - Fuel was observed seeping from around the drive shaft consistent with a shaft seal leak.

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1.1 Left Electric Fuel Pump Photos



Figure 1: Pressure Test at 14 PSI

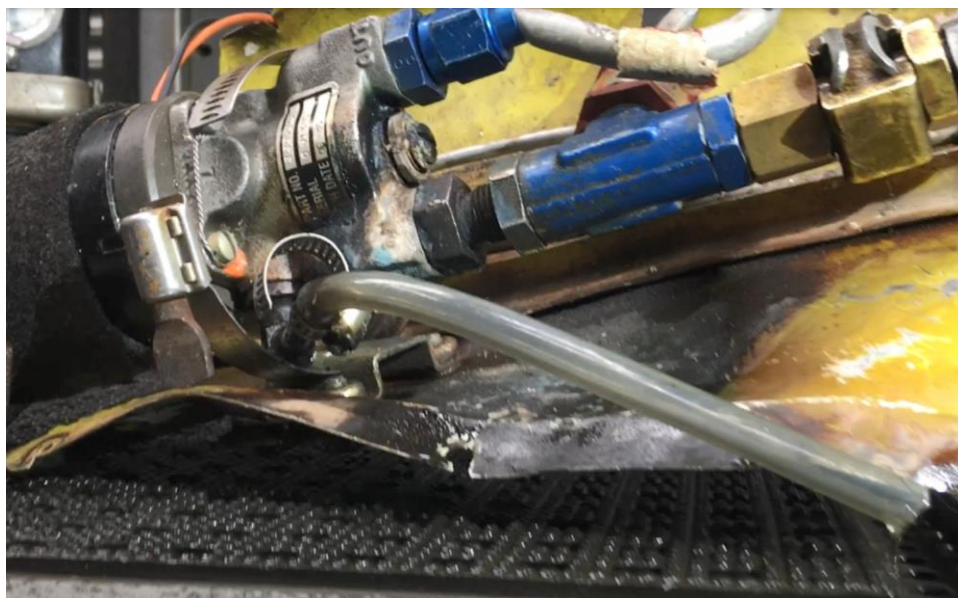


Figure 2: Operational Test (with 5 PSI Inlet Pressure)



Figure 3: Vacuum pump was attached to the pump outlet and the assembly was placed in a bag.



Figure 4: Drive from Motor



Figure 5: Pump Drive



Figure 6: The pump Itself was Installed onto a Test Bench

END. - Submitted by Samantha Link